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S-Series Autotransaxle Removal

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01-18-2004, 11:18 PM

#1

[wolfman](#)

Super Member



Join Date: Jun 2002
Location: Texas
Posts: 12,066

[wolfman's Photos](#) **S-Series Autotransaxle Removal**

CAUTION! I am NOT a technical manual writer. That being the case, I may have left a thing or two out of these instructions unintentionally. PROCEED AT YOUR OWN RISK! If you run into an unexpected or unmentioned item or problem, STOP!, and ask for assistance from someone experienced and/ or from the board!

91'-02' Saturn "S" Series automatic transaxle removal

WARNING this is a VERY involved undertaking!

You will need:

GOOD set of jackstands

Floor jack

Set of metric wrenches and sockets INCLUDING a 30mm HEAVY DUTY Socket for the axle shaft nuts.

Torque wrench

LARGE (3ft) pry bar

2- 3ft 2"x 4" boards and either 2 approx 2 foot lengths of STRONG rope, steel cable or chain with "hooks" on the ends.

Replacement cotter pins for ball joints and tie rod ends

Ball of STRONG twine, couple of coat hangers

PROCEED AS FOLLOWS:

1. Remove the hubcaps or mag centercaps of both front wheels and LOOSEN but DO NOT REMOVE the 30mm axle shaft nuts
2. CHOCK THE REAR WHEELS AND SET THE PARKING BRAKE
3. Raise the front of the car and support it on jackstands (DO NOT place the jackstands in contact with the engine cradle!) You want to get the FRAME of the car 16 inches MINIMUM off the ground. Drain the transaxle fluid by removing the drain plug from the lower differential housing case.
4. Remove the battery, battery tray, air filter housing and air intake snorkel.
5. Remove the coil packs and DIS module as an assembly
6. Disconnect the shifter cable and electrical connections from the transaxle neutral safety switch, the turbine speed and transaxle fluid temperature sensor, transaxle to PCM electrical control connector from the top of the upper valve body cover, and the VSS connector. Set them out of the way toward the firewall side of the engine compartment.
7. Remove the three bolts holding the exhaust manifold to the exhaust downpipe, allow the pipe to drop down. Remove the rubber straps holding the exhaust pipe to the hanger back by the catalytic converter and allow the pipe to hang down. You DO NOT need to remove the pipe, BUT if the pipe is connected to the underside of the car by a ridged hanger (some are, some aren't) you'll need to remove the bolts connecting it to the hanger so it will "sag" down.
8. Remove the NUTS holding the battery ground cables to the upper bell housing bolts and remove the cables/wires
9. Remove the torque converter inspection cover at the lower bell housing. Remove the four nuts that secure the torque converter to the flex plate one at a time by rotating the torque converter by hand to gain access to each in turn. When you have removed them all, push the torque converter AWAY from the engine and TOWARD the transaxle as far as possible. Remove the two transaxle to radiator cooling lines from the transaxle and tie them out of the way toward the firewall side of the engine compartment.
10. Remove the wheels and inner wheel well splash guards
11. DO THIS ON BOTH SIDES. Remove the brake caliper (DO NOT disconnect the brake line!) and hang it out of way on a coat hanger. Remove the tie rod end nut cotter pins and nuts, then drive the tie rod out of the knuckle with a hammer and a block of wood used to protect the threads on the tie rod end. Remove the ball joint cotterpin and nut. Place your 3ft pry bar OVER the lower control arm and UNDER the engine cradle, BE CAREFULL not to damage the ball joint rubber grease seal boot. Press DOWN on the lower control arm with the pry bar and rap sharply on the SIDE of the KNUCKLE where the ball joint goes through. The ball joint will pop out DOWNWARD with the control arm, pull the strut/knuckle assembly outward slightly to prevent the ball joint end from reinserting. Drive the axle out of the hub with a hammer and a block of wood after removing the 30mm axle shaft end nut(s). Disconnect the ABS sensor wiring connector and retainer (if equipped) Remove the three nuts at the TOP of the strut tower under the hood, then remove the strut, rotor,

knuckle AS AN ASSEMBLY. (It is NOT 100% necessary to actually remove the struts, BUT you will have far less stuff in the way/ to deal with when it comes time to drop/reinstall the cradle)

12. Remove the DRIVERS side drive axle by CAREFULLY prying it out of the differential case with a screwdriver. Remove the PASSENGER SIDE axle shaft by driving it out of the intermediate shaft with a block of wood and a hammer. BE CAREFULL not to damage the CV joint boots and DO NOT YANK on the axle shafts.

13. Place your 2 X 4's across the engine compartment from front to rear directly above the lifting "eyes" on the engine, with one end of the board(s) on the upper radiator support, and the other end on the edge of the upper firewall where the rubber hood weather strip runs on the metal lip. TIGHTLY run your cable, chain or rope through the lifting eyes and around the boards. NOTE: This is ALL that will be supporting the weight of the engine and transaxle shortly (300+ lbs!) GET THIS TIGHT AND SECURE

14. From below, remove the transaxle to engine stiffener plate

15. Remove the intermediate shaft to engine block mounting bolts and then CAREFULLY pull the intermediate shaft out of the transaxle. (Note: this is not 100% necessary, but on reinstall it is easier to position the transaxle without having to worry about getting the shaft reinserted into the differential case without damaging the seal)

16. Remove BOTH the engine AND transaxle mount(s) to engine cradle mounting bolts. On 91's completely remove the "shock absorber" style transaxle mount also. On 92' and up and ALL DOHC cars, remove the LOWER "dogbone" transaxle and engine mounts. (TOP torque axis mount can STAY ON the engine but all transaxle mounts MUST be disconnected)

17. Confirm there is now NOTHING connecting the engine OR transaxle to the engine cradle. Be especially careful to check for wiring harness and other retention clips. Remove the lower radiator splash shield. TIE THE RADIATOR to the upper radiator support with some stiff/strong twine on the upper sides

18. Loosen but DO NOT REMOVE the 4 engine cradle to space frame bolts. NOTE: These are on VERY tight. Use some PB Blaster and soak them from behind the night before and then use a STRONG high quality 6 POINT socket.

19. Reconfirm that there NOTHING connecting the engine or transaxle to the engine cradle. That being the case, remove the FRONT cradle to space frame bolts FIRST and allow the cradle to dangle, then remove the rear bolts. THE CRADLE IS HEAVY! (The lower control arms and torque (sway) bar will be coming out with it) It will drag down the hanging exhaust pipe with it, maneuver it over the pipe and drag the cradle out from under the FRONT of the car.

20. Remove the lower and upper transaxle to engine bolts. Place a floor jack under the transaxle and lift it SLIGHTLY, this should be enough to start to separate it from the engine, once it starts to separate, pull or carefully pry the two apart while supporting the transaxle with the floor jack. Once it has cleared the engine, lower the floor jack and transaxle out the bottom of the car. NOTE: It may help to separate the engine from the transaxle to lower the rear portion of the engine slightly. I accomplish this by installing my 2 X 4's "on end" and then turning the one closest to the passenger side on its side after the engine cradle is out, effectively lowering that end only by about 3 inches.

Install is the reverse (LOL)
TIPS FOR INSTALL.

Just in front of where the FRONT engine cradle bolts install you will find an alignment hole on each side. Locate a deep well socket that fits TIGHTLY into these holes. Lift the engine cradle into place and LOOSELY install ALL the bolts, then insert your deep well socket mounted in a 3 or 6 in extension into these holes and use it to align the cradle with the holes BEFORE tightening down the front bolts. Failure to do this will result in a severely out of line front end and a car that "dog walks"

When raising the cradle, make SURE the lower radiator support tabs mesh with their holes in the cradle, and that the rubber insulators are still there and that the exhaust pipe is ABOVE the front lip of the cradle, and UNDER the cradle back by the downpipe to converter connection point.

DO NOT FORCE the transaxle into the engine, or use the bolts to bring them together! When things line up right, the two WILL mesh right together with no gaps between them what so ever. Do not worry when mating the transaxle to the engine if the torque converter bolts align or if the torque converter touches the flex plate once it is installed, this is easy to remedy from below when bolting the torque converter back to the flexplate via the inspection cover.

Use NEW cotter pins on the ball joint and tie rod end castelated nuts.

Use a TORQUE WRENCH and MAKE SURE to torque the engine cradle, tie rod and axle hub nuts to spec. It is impossible to get a torque wrench on the ball joint nut with the strut installed in it's holder on the knuckle, but you'll need an alignment if you remove the strut from the knuckle., so unless you WANT to pay for an alignment, get it as tight as possible (torque spec is 80ft lbs) with an open end or box wrench and install the cotter pin. DO NOT loosen the nut to install the pin.

BE CAREFUL when inserting the intermediate shaft and drivers side axleshaft into the transaxle not to damage the seals on the transaxle with the shaft splines. AND when reinstalling the cooling lines not to cross thread them.

I STRONGLY RECOMMEND you purchase a Haynes, Chilton or Factory service manual BEFORE undertaking this operation!

...
Old Saturns never die, people KILL them, so check your damn oil!
"Unthinking respect for authority is the greatest enemy of truth." Albert Einstein

REWARD EXCELLENCE!



Rate the quality of this post and help *wolfman* reputation points. Click the reputation button near the bottom left corner of this message box. Thank you!



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04-12-2004, 02:32 AM

#2

[wolfman](#)



Super Member   Join Date: Jun 2002 Location: Texas Posts: 12,066 wolfman's Photos    	Addendum: BEFORE lowering the cradle, you MUST also remove the two bolts securing the steering rack to the cradle, and the plastic clip securing the brake line to the cradle as well. (Like I said in the beginning, I might forget something!) ... Old Saturns never die, people KILL them, so check your damn oil! "Unthinking respect for authority is the greatest enemy of truth." Albert Einstein REWARD EXCELLENCE!  Rate the quality of this post and help <i>wolfman</i> reputation points. Click the reputation button near the bottom left corner of this message box. Thank you!
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05-16-2004, 09:10 PM #3	
jasonpopnc Member  Join Date: Feb 2004 Location: Durham, NC Posts: 205   	 Some notes/things I did different (The numbers refer to Wolfman's how-to numbers): General: This is based on a 95 SL2 DOHC. Label all wires/connections you disconnect (use some type of coding system ie: EL1 for an electrical connection), using a sharpie and masking tape, then write a description on a separate piece of paper. This will make reinstall easier. Also when you remove bolts, place them in small plastic bags and clearly label the bags with a sharpie and put them in a small box. 3. Place the jack-stands directly behind the rear engine cradle-to-frame mounting bolts. I found this place to most stable. The rear engine cradle bolts (18mm) are located in "cups" under the car, just below the front door hinges. 4. All these require 10mm socket. 5. The DIS uses 8mm socket. 6. Use a large flat screwdriver to disconnect the shifter cable assy from the housing. There are 2 release tabs on the part. 7. I completely removed this section of exhaust pipe. Remove the 3 nuts up near the exhaust header and the 3 nuts back near the catalytic converter. Then remove the 2 nuts near the flex pipe that hold the exhaust to the engine-trans stiffener plate. 9. Remove the engine-trans stiffener plate (15mm socket-6 bolts) BEFORE removing the torque converter cover (8mm socket-3 bolts). The 4 bolts that hold the flex plate (aka flywheel) to the torque converter are 15mm heads. Then you can push the torque converter away from engine about 1/2 to 3/4 inch. 11. I used a small hammer to get the tie rod end nut out of the knuckle. Be VERY careful not to damage threads! Do this with the nut OFF! I used the same technique to get the axle out of the knuckle. VERY light taps on the end of the axle with the nut off. (Note: I borrowed a 3' torque wrench and 30mm socket from work to get the axle nut off and back on - this came in very handy with reinstall!) 13. I used a 4x4 across the top near the lifting eye on the right side of the engine. I did NOT remove the upper engine mount on the left side of the engine. This seemed to hold well. 17. I removed the lower radiator splash shield way earlier. It was held in place with 4 retention clips. 18. FYI: The engine cradle is part of the frame that holds the engine to the frame. Weighs about 50-60 lbs. Other Notes: INSPECT your replacement transmission. Specifically look at the seals, Axle seals (where the axles go in) for rips/tears. Also, there is a rubber o-ring on the torque converter. The torque converter is a circular part that looks like a donut with no hole and a small shaft on one side. On the shaft there is a notch, behind the notch there is a small groove for an o-ring. I did NOT look for this oring. Completely installed trans and it leaked. Inspected the trans I had removed, and noticed the torque converter (TC) did not come off very easily. Actually it took some force to get that bugger to move. When I did get it off, there was an o-ring. I remembered looking at the TC on the new one and it came off VERY easily. LEARN from my mistake! If I had looked in the Haynes manual I would not made this mistake. Take your time if you want to do this right. This took me 14-16 hours to do. I never did ANYTHING this big. I have only done brakes, serp. belt, oil, ATF, (the small stuff) before this. REWARD EXCELLENCE!  Rate the quality of this post and help <i>jasonpopnc</i> reputation points. Click the reputation button near the bottom left corner of this message box. Thank you!

09-06-2005, 12:52 PM #4	
sbbloom69 Junior Member  Join Date: Apr 2005 Posts: 41   	 Re: S-Series Autotransaxle Removal Hi, My additional notes on a recent 92 Auto installed in a 91 SL-2 The junk yard guaranteed me the tranny was from an "early" 92, and so it should just drop in.





WRONG!

Maybe it was my fault for not checking closer. I even sat the 2 tranny's next to each other before installing the used one.

I followed the instructions on this thread. What a life saver! Of course, I forgot the clip on the back of the cradle and damn near pulled the brake line off the firewall!

Anyway I got the new tranny in, cradle up. Lo and behold, there are no holes for the front and rear transaxle mounts. The tranny castings are the same, but the holes aren't drilled for the 91 style mounts.

Is the "difference" between a 91 and later, or this this a difference between 91 and early 92? If this is the difference between the 91 and all later trannys, it doesn't look like too bad a problem to do the mods. The castings are there. All that's required is to drill and tap the 5 holes into the mounts.

I have had to drill and tap the 2 mounting holes for the front "shock absorber" mount, and 3 holes for the lower rear mount. It was a real pain in the ass to drill and tap these holes with the tranny back in the car. But, I wasn't about to drop it again.

Stuart
91 SL-2

REWARD EXCELLENCE!

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